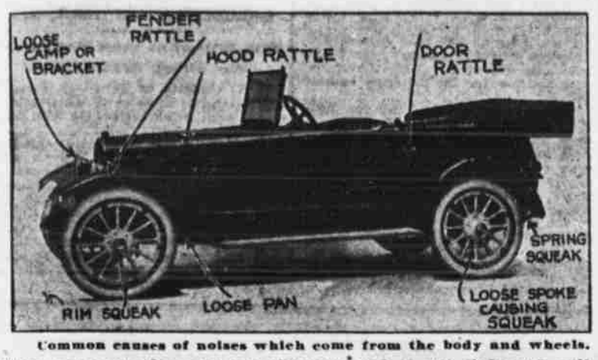
CAR NOISES AND HOW THEY MAY BE REMEDIED

The Twenty-third of a Series of Articles by an Expert for the Automobile Owner.

By WALTER SHIELDS.

Quietness is a desirable quality in any piece of machinery, not only because the clicks, rattles, pounds, &c., are annoying, but because the absence of these indicates that the parts are well fitted and operating properly. The automobile, with its hundreds of parts, develops in the course of time a variety of noises which every owner is quite anxious to remove, his prime motive being to destroy them because they disturb the mental equilibrium of the driver and passengers, but incidentally their removal makes for a car which will give better service for a longer period. How many times have you been asked why such and such a make two years old is so extremely quiet, while another even after a few months running emits every sort of annoying sound? The reason for the silence in the well made foreign and American cars is due primarily to fitting when the car is made. Two moving parts very accurately fitted when they are assembled at the factory will tend to operate in that same condition for a long

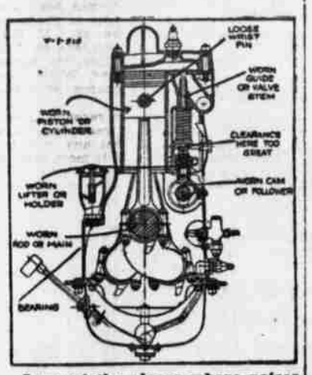


Common causes of noises which come from the body and wheels. These parts are loosened by vibration and if not tightened will cause the most disagreeable combination of noises imaginable, usually referred to as "body music."

period, granting of course that they are properly lubricated. One of our American manufacturers spends as much as $150 per car merely to remove slight noises after the car has been completely assembled. The real reason behind the almost total absence of noise is one of the best British made cars, is that the parts are hand fitted. This hardly is possible or even desirable in our big production cars such as the Ford, Overland, Studebaker and others, but the owners on this side, where standardization has been carried to almost every part of the car, can do a great deal toward keeping the various parts in proper condition so they will not be apt to become noisy and also they can learn to distinguish a serious noise from a harmless one and know how to correct both.

Three-fourths of the noises which are most troublesome come from the engine and naturally so because it contains a greater number of parts than any other unit and more than any two in combination. Valve clicks and slaps are most common.

These are easily distinguishable by the period of occurrence. The cause may be in too much clearance between the tappet and the valve stem or in overhead mechanism between the lifter and the push rod. This clearance may be reduced of course, but if the owner will make tappet adjustments when the engine is hot and make the clearance barely perceptible when the tappet is moved up and down trouble from this source will vanish. However, the clicking might be caused by the lifter being loose in its guide, and this of course cannot be removed unless the lifter assembly is removed and examined. If the lifter itself is worn it is usual to replace it, but often the guide is of such design that it may be sprung slightly to hold the lifter tighter. Few owners look to



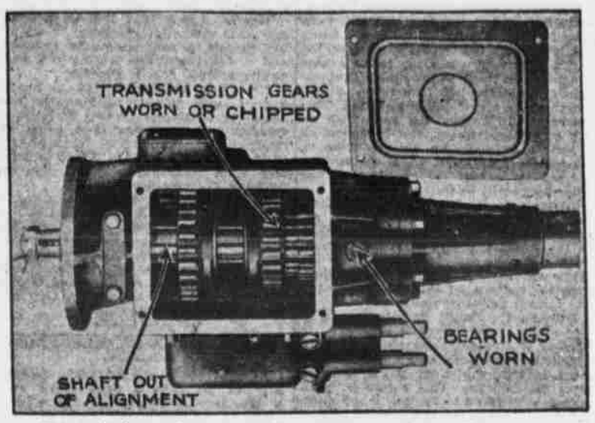
Some of the places where noises originate that should receive careful attention.

this place for wear, blaming the clearance in most cases. There may be too much clearance between the cam and the follower, due to either cam or follower wear. Sometimes the fitting of new followers quiets the engine to a remarkable degree. Somewhat the same noise is produced by worn valve stems or stem guides. This is easily determined by removing the valve springs and testing each valve separately. Merely hold the stem between two fingers and move it sideways in its guide. There should be no play perceptible and if there is too much it means you must install a valve with an oversize stem or fit a bushing to the guide. The best way is to fit the stem in the bushing before you install the latter in place. If a valve head warps it will slap against its seat and incidentally cause trouble in that cylinder, so when the valves are removed the heads should be examined. It does little good to attempt to grind in a valve with a warped head.

The valve gear in an overhead valve engine is apt to be a little more noisy than that of the conventional L head because of the greater number of joints, but if these are properly adjusted and lubricated there should be no more noise than in another engine. Sometimes, however, there is too much side play in the rocker arms, with the result that they slap or an arm bearing is worn. Where the arm is not bushed it will require a new part and sometimes the shaft upon which the arm moves is worn. This may be taken up by installing an oversize bushing in the rocker arm.

Though a great deal of the troublesome clicks come from the valve gear, there are other parts of the engine which are likely to cause noise which is a result either of wear or improper alignment. The bearings in most of our engines are, as stated in a previous article, made of some soft metal. When insufficiently lubricated this metal burns and with continued use through a long period it becomes flattened with the result that there is a so-called knock. When the bearing is slightly worn the bearing wear increases it becomes louder and louder and sounds like a hammer blow upon a piece of very hard wood. The usual remedy is to "take up" the play by removing a shim between the bearing halves or trimming the metal on the movable half. When this is done and the moving part not accurately fitted in the bearing the to fix the old bearing flanges so they will be thicker. Get a new bearing.

Often a lower rod or crankshaft bearing is blamed for play in the upper rod bearing. Some times there is no bushing at the top, which is found in the cheaper cars, while in the others there is a bronze bushing to take the wear. Where there is no bushing it means that a new piston pin will have to be installed or if the piston bosses are worn eccentric it may mean a new piston or possibly the fitting of a bushing. The piston itself or the cylinder may be worn, resulting in a knock which is not unlike that produced by preignition. The piston being too loose



Transmission noises are quite common and usually are caused by misalignment of shafts or gears. It is possible in unit power plant construction to cause binding of a transmission gear by im-

it slaps against the cylinder walls. The remedy is to get a new piston, but in such a case it is always best to assume that all the pistons or most of them are worn and install a new set. Sometimes the fitting of new rings is sufficient to take up the little extra play. A good workman should always examine the cylinders to determine whether or not they are out of round. If they are to any extent they will have to be rebored. Most engines will take two reborings of a few thousandths each time. This is good practice and gives practically a new cylinder block. The work must be done carefully and new oversize pistons must be fitted and properly lapped in.

Timing gear or chain noises are troublesome mainly because it is difficult to cure them without much trouble. In the silent chain drives there usually is an adjustment for wear, but where there is none it means shortening the chain by removing a link, or getting a new chain. The chains stretch, especially at the beginning. Those having excessive chain trouble should consult a good mechanic, for usually an idler can be installed to take up excessive chain slack. In the gear drives there is comparatively little trouble now as compared with those had when spur gear drives were common. The helical gearing now used is quiet and remains so for long periods if the gears are properly lubricated.

Engine auxiliary shaftings are not apt to cause any trouble, but the accessories, if not properly cared for, are likely to become noisy. This is true of the generator end bearings, which must be oiled at intervals, and to the bearings on the water pump shaft, if there is a pump. Ususally grease cups are provided for the latter bearing.

Then there is the all common preignition knock, which may be caused by carbon, too much spark advance, poor timing, overheating, overloading engine, poor mixture, &c. In every case the gas explodes before it should, resulting in a thrust upon the piston before it normally descends, causing it to strike against the cylinder walls. The preignition knock is that metallic clank which you hear when you advance the spark too far and the engine is pulling hard. Due to the timing, some engines will give this knock when the engine is pulling on level ground. The remedy is, of course, to determine the cause and eliminate it, since there are many causes of this particular knock.

Tight parts as well as loose ones may cause knocking or pounding.

Aside from the important engine noises mentioned there are others perculiar to certain types of engines, and if any readers of THE SUN are unable to remove the causes of troublesome noises a letter to this department will bring helpful information.

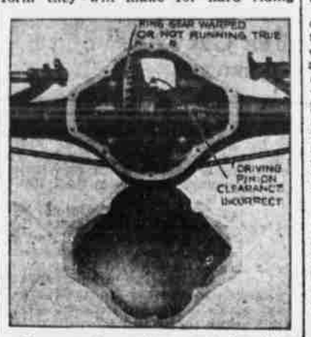
Clutch bucking is a fairly common complaint, and a rattling under the floor boards on a par with it. The bucking may be caused by misfiring of the engine on a hard pull. The owner sometimes is not aware that the engine is misfiring and blames the clutch. The clutch might cause it, and often the fault lies in a worn thrust bearing, permitting back and forth movement to such an extent that there is continual knocking. When running fast the noise seems to disappear.

Transmission noise is more common. Many owners are troubled with the noise, but overlook it because nothing breaks. When one of the shafts is out of alignment, due to a worn bearing or a gear that binds, the transmission is bound to be uncomfortably noisy. Sometimes the transmission case itself is not true, throwing both shafts out of alignment. Often a gear becomes broken because of the misalignment and the owner promptly has the gear replaced. This does not remove the cause, and in most cases the second gear will become noisy and finally have some teeth broken. The misalignment must be corrected before the trouble will vanish.

Propeller shafts and joints rarely give any trouble, but the rear axle in many cars emits peculiar noises. When the driving pinion and the ring or differential master gear are not running true there will be a loud hum, with a stress at each revolution. This trouble may be caused by the ring gear itself being warped or by the pinion shaft bearing being worn. A loud hum also is caused when the pinion and gear clearance is either too great or too small. Most cars have some form of adjustment to take up wear of the gear teeth, the adjustment consisting of a shifting of the differential unit. This work requires expert hands and should not be attempted by any owner not thoroughly familiar with it.

An owner not long ago came to the writer and remarked that he had had two differential units replaced and it sounded as though another would have to be put in. He blamed it on the materials of the gears. A thorough examination proved that the whole rear axle was out of alignment. The shafts were not running true, nor the differential, nor the wheels. No matter how many parts are replaced if they run out of true they will be damaged in a short time. When troubles reoccur for no apparent reason have the alignment checked up by some one who knows how to do the work.

Aside from the major noises mentioned there are innumerable minor squeaks and rattles which every owner is familiar with and which are looked for in the springs, the body, the doors, &c. Springs and shackles if properly lubricated will not squeak, but if they are not oiled and rust is permitted to form they will make for hard riding



Rear axle noises and troubles are not new to many owners. The gears may have too little or too much back lash, the ring gear may be warped or otherwise running out of true, or the housing may be sprung. Persistent breakage of parts usually is caused by misalignment.

with undesirable "music." Body squeaks are very often hard to find, but if the body bolts are tightened occasionally it might prevent frame riding. Felt inserts are commonly used by owners to stop door rattles and they are perhaps as good as anything. In some of the cheaper grades of cars it is a hopeless task trying to remove body noises because of the weaving of the body.

Rod noises from underneath are heard mostly when the car runs over rough ground. If the rods can be held firmly against some other part, which they usually cannot, it will stop the noise, but in most cases it is due to the rod being too long. Indeed in time it becomes bent from this movement. Some owners to stop the trouble substitute a cable arrangement for the rods.

Wheel squeaks are quite annoying, although not common. These may be caused by loose spokes or by a loose rim, more often the latter. When the rim is held on by lugs the lugs may be worn, not tight, or the rim may be sprung or oversize. Many dealers have metric rims for certain customers, and an owner recently received one in place of the regular, with the result that he had a continual rim slap. When the rim is not tight, aside from being noisy, it causes undue wear on the tire by scraping it across the road.

BIG SAXON ECONOMY RUN.

A Thousand Dealers Will Participate on Wednesday.

To furnish complete statistics on the cost of operation of the Saxon Six, a thousand Saxon dealers in as many cities and towns will conduct a 300 mile economy run on Wednesday of this week. Last year 206 Saxon dealers participated in a 300 mile non-stop run which demonstrated beyond any doubt the remarkable fuel economy of the Saxon Six. As that test did not furnish data on tire wear, depreciation, oil consumption and general upkeep, it was to determine these points accurately that the present proposed run is being scheduled.

In spite of the fact that the motor car now is recognized as a transportation unit and not a luxury, the Saxon desires to find out whether the auto is as economical to the average man as other carriers, such as street and railway cars. The proposed run, it is believed, will reveal figures that will give a fair estimate of actual running costs in everyday service. It will not be nonstop. It will be conducted to represent as accurately as can be the work that the average motor car is called upon to do.

Every dealer entered in the contest will be required to keep accurate records of fuel and oil consumption and skilled mechanics will inspect each car before and after the run to get an estimate of depreciation. From these figures an average will be taken, which it can be assumed will represent the complete cost of operation of a Saxon Six.

In the non-stop run of last year the average gasolene consumption was 23.5 miles to the gallon. The car sent out by Sales Manager W. J. Clemens of the local Saxon agency will endeavor to beat last year's record.

Franklin—43 Miles—One Gallon of Gas.

A Franklin six cylinder touring car driven by Charles F. Fox, representing Glenn A. Tisdale, the local Franklin dealer, and carrying two observers, covered forty-three miles over the Boston Post road on one gallon of gasolene. This was one of more than 200 Franklins in various parts of the country participating in a gasolene economy test.

Starting at the beginning of the Post road in The Bronx, the car was driven as far as Stamford, Conn., 22.4 miles, and then back, 20.6 miles, where the last drop of gasolene was used and the car came to a stop. The route was chosen with the idea of approximating as closely as possible actual touring conditions.

The Tisdale entry was a regular stock five passenger car, with a bottle containing a carefully measured gallon of gas mounted in a frame on one of the running boards in plain view of the driver and passengers. The observers were Burton S. Brown, automobile editor of THE SUN, and Edgar Pool, automobile editor of the *Evening World*. At the conclusion of the run they signed before a notary the official report of forty-three miles for the trip.

The forty-three miles were covered in 2 hours and 28 minutes. The start was made at 10:42 A. M. and the route lay through Pelham, New Rochelle, Larchmont, Mamaroneck, Rye, Port Chester, Greenwich, Cos Cob into Stamford, Conn., where a turn was made at noon for the homeward journey. It was 1:10 P. M. when the motor stopped.